

***Claims***

What is claimed is:

1. (Currently Amended) A sensor system with variable sensor-signal processing, comprising:

a integrated circuit sensor unit that includes

(i) a sensor element that provides a sensed signal in response to a measurement variable, and

(ii) a memory device that stores adjustable coefficient values; and

(iii) a sensor signal processing unit that processes said sensed signal using adjustable coefficient values to provide a sensor output signal on a output line,

wherein said sensor system receives updated adjustable coefficient values via said output line and stores said updated adjustable coefficient values in said memory device, and an analytical unit;

~~—the sensor unit comprises a sensor element to detect a measurement variable (M) and to generate a sensor signal (U(M)) to represent the measurement variable (M), and a sensor signal processing unit to process a sensor signal (U(M)), which represents the measurement variable (M), in accordance with prescribed parameters ( $e_1, e_2, e_3 \dots e_m, e_{m+1} \dots e_M$ ), such that the parameters ( $e_1, e_2, e_3 \dots e_m, e_{m+1} \dots e_M$ ) for processing the sensor signal can be adjusted externally;~~

~~—the sensor element has at least one input to which the measurement variable (M) can be conducted, and at least one output, from which the sensor signal (U(M)), representing the measurement variable (M), can be tapped;~~

~~—the sensor signal processing unit has at least one input and at least one output ( $A_1, A_2, A_3 \dots A_k, A_{k+1} \dots A_K, D_1, D_2 \dots D_n, D_{n+1} \dots D_{N-1}, D_N$ );~~

~~—at least one input of the sensor signal processing unit is connected to at least one output of~~

the sensor element;

~~– at least one output (A) of the sensor signal processing unit is assigned to output the sensor signal (Out), which has been processed in the sensor signal processing unit;~~

~~– at least one output (A, A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>) of the sensor signal processing unit is connected to the analytical unit, through a corresponding connecting line (A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>);~~

~~– the analytical unit functions to analyze output signals (Out) which are transmitted from the sensor signal processing unit, wherein~~

~~– the analytical unit further functions to redefine at least one parameter (e<sub>1</sub>, e<sub>2</sub>, e<sub>3</sub>, e<sub>m</sub>, e<sub>m+1</sub>, ..., e<sub>M</sub>; A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>) for signal processing, on the basis of output signals (Out) delivered by the sensor signal processing unit;~~

~~– there is at least one connecting line or a wireless connection path between the sensor signal processing unit and the analytical unit, to transmit at least one of the newly defined parameters (e<sub>1</sub>, e<sub>2</sub>, e<sub>3</sub>, e<sub>m</sub>, e<sub>m+1</sub>, ..., e<sub>M</sub>; A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>) to the sensor signal processing unit, to modify the processing of the sensor signals~~

~~– the sensor signal processing unit functions to set the transmitted parameters (e<sub>1</sub>, e<sub>2</sub>, e<sub>3</sub>, e<sub>m</sub>, e<sub>m+1</sub>, ..., e<sub>M</sub>; A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>).~~

2.(Currently Amended)      The sensor system of claim 1, further comprising an analytical unit that receives said sensor output signal and provides said updated coefficient values. ~~characterized in that~~ a connecting line for transmitting the redefined parameters (e<sub>1</sub>, e<sub>2</sub>, e<sub>3</sub>, ..., e<sub>m</sub>, e<sub>m+1</sub>, ..., e<sub>M</sub>; A<sub>1</sub>, A<sub>2</sub>, ..., A<sub>k</sub>, A<sub>k+1</sub>, ..., A<sub>K</sub>; D<sub>1</sub>, D<sub>2</sub>, ..., D<sub>n</sub>, D<sub>n+1</sub>, ..., D<sub>N-1</sub>, D<sub>N</sub>) is that connecting line (A) which is connected to the output (A) which outputs the processed sensor signal.

3.(Currently Amended)      A sensor system with variable sensor-signal processing, comprising:  
a integrated circuit sensor unit that receives power via a first line and includes  
     (i) a sensor element that provides a sensed signal in response to a measurement  
variable, and  
     (ii) a memory device that stores adjustable coefficient values; and  
     (iii) a sensor signal processing unit that processes said sensor signal using adjustable  
coefficient values to provide a sensor output signal on a second line,  
wherein said sensor system receives updated adjustable coefficient values via said first line  
and stores said updated adjustable coefficient values in said memory device.~~The sensor system of~~  
~~claim 2, characterized in that a connecting line which transmits the determined parameters is a~~  
~~common power supply line (V) for the sensor unit and the analytical unit.~~

4.(Cancelled)

5.(Cancelled)

6.(Currently Amended)      The sensor system of claim 52, wherein~~characterized in that at least~~  
said adjustable coefficient values~~one parameter~~  $(c_1, c_2, c_3, \dots, c_m, \dots, c_M)$  ~~can be transmitted by the~~  
change of an output load ( $I_{load}$ ) on said output line~~between the said sensor-signal processing unit and~~  
~~the analytical unit.~~

7.(Currently Amended)      The sensor system of claim 6,~~characterized in that~~ wherein the output

load ( $I_{load}$ ) is continuously variable.

8.(Currently Amended) The sensor system of claim 76, ~~characterized in that~~ wherein the output load ( $I_{load}$ ) is stepwise variable.

9.(Currently Amended) The sensor system of claim ~~83~~, wherein said adjustable coefficient ~~characterized in that at least on parameter ( $e_1, e_2, e_3, \dots, e_m, \dots, e_M$ )~~ can be transmitted by changing a supply voltage ( $U_s$ ) on said first line for the said sensor unit.

10.(Cancelled)

11.(Cancelled)

12.(Cancelled)

13.(Cancelled)

14.(Cancelled)

15.(Cancelled)

16.(Cancelled)

17.(Cancelled)

18.(Cancelled)

19.(Cancelled)

20.(Cancelled)